

### **REMARKS**

Reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks is respectfully requested.

By this Amendment, the specification is amended, Fig. 1 is amended, and claims 3-7, 9, 10-12, 14-21, and 23-26 are amended. In addition, new claims 27-35 are added to secure an appropriate scope of protection to which Applicants are believed entitled. Support for the added claims is believed to be found in the original claims and disclosure of the present specification. Accordingly, claims 1-35 are pending in this application.

### **Amendments to the Specification**

The Examiner objects to the title of the invention, alleging that the title is not descriptive. Applicants amend the title to obviate the objection thereto.

### **Objections to the Drawings**

The Examiner objects to the drawings, alleging that the draws fail to depict every feature of the invention specified in the claims. Replacement Fig. 1 is submitted herewith wherein a second detector coil 4 and a symbol named "SEPARATION" representing the means for separation. Accordingly, withdrawal of the objection to the drawings is respectfully requested.

### **Objections to the Claims**

Claims 7, 9, 11, 14, 16-17, 21, 23 and 25 are objected to because of informalities.

The Examiner alleges that claims 7, 9, 14, 16-17, 21, and 23 contain phrases, e.g., "optionally adjustable," "preferably," and "particular" that are not positive limitations. The claims are amended to remove the objected to language.

The Examiner further alleges that claims 9 and 23 lack antecedent basis for the claimed "inflection points," and it is vague as to what is a "characteristic point," "inflection point," "extrema," "standard positions," "limiting values," or "fringe range."

Claims 9 and 23 are amended to delete the word "characteristic," and replace the phrase "standard positions" with "preset positions," "standard positions," with "preset positions;" "limiting values" with "limit values;" and "fringe ranges" with "limit ranges.

Regarding the objected to "inflection point" and "extrema" of claims 9 and 23, these features are moved to new claims 29 and 35. Applicants respectfully submit that the standard for which enablement of a disclosure is judged is that of one "skilled in the art." In the present case such a person is a person with extensive knowledge of mathematics. Particularly, this skilled person is familiar with differential calculus and graphs of a function. In mathematics the term "inflection point" designates a "change in curvature of an arc or curve from concave to convex or conversely," (see <http://www.merriam-webster.com/dictionary/inflection>). The curve change from being concave upwards (positive curvature) to concave downwards (negative curvature), or vice versa. If one imagines driving a vehicle along a winding road, it is a point at which the steering-wheel is momentarily "straight" when being turned from left to right or vice versa. This definition is general knowledge that should not require further definition.

Regarding the objected to term "extrema," Applicants submit that in mathematics, the term "extrema" is defined as "a maximum or a minimum of a mathematical function," (see <http://www.merriam-webster.com/dictionary/extrema>). The maxima and minima are respectively the largest value and smallest value that a function takes in a point either within a given neighborhood (local extremum) or on the function domain in its entirety (global extremum). Again, this definition is commonly known and needs no further definition.

Applicants respectfully submit that there is a strong presumption that an adequate written description of the claimed invention is present when the application is filed, and that the PTO has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in Applicants' disclosure a description of the invention defined by the claims. In re Wertheim, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976) ("we are of the opinion that the PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not

recognize in the disclosure a description of the invention defined by the claims"). The claimed "inflection point" and "extrema" based upon the specification and the PTO has failed to meet the burden of presenting reasons why a skilled mathematician would not recognize and understand the use of the objected to language both in the disclosure and the claims. Accordingly, withdrawal of the rejection is respectfully requested.

Regarding claims 11 and 25, the Examiner alleges that the term "means for separation" is unclear. Applicants respectfully disagree and submit that the originally filed specification, at the middle of page 8, discloses activating means for the separation of the detected field-influencing part of the material flow. Furthermore, those skilled in the processes for the separation of parts from a stream of material generally use this term as a generic term for designating commonly known devices like flaps, air jets, spring devices, etc. that are used for the task of separation.

Based upon the aforementioned described separation means and because the PTO has failed to meet the burden of presenting why a person of ordinary skill in the art would not recognize in Applicants' disclosure a description of the invention defined by the claims, Applicants respectfully submit that one of ordinary skill in the art would reasonably interpret the claimed "means for separation."

In view of the foregoing, Applicants respectfully submit that the claims fully comply with commonly accepted US patent practice. Accordingly, withdrawal of the objections to the claims is respectfully requested.

#### **Claim Rejections under 35 USC 103(a)**

Claims 1-26 stand rejected under 35 USC 103(a) as being unpatentable over Inoue (5,045,789). Applicants respectfully traverse this rejection for the following reasons.

Notwithstanding the Examiner admission that Inoue fails to explicitly disclose forming locus curve, the Examiner posits that Inoue teaches evaluating waveforms and vectors. The Examiner further posits that "[t]he use of locus curve in lieu of vector analysis to identify the metal in a material flow would be a common approach within the

level of ordinary skill in the related art. Both analyses would provide the same result." The Examiner further alleges that the method claims "recited for using the apparatus in claims 1-12 are an inherent use of the apparatus of Inoue and are rejected on the same grounds. One of ordinary skill would find it inherent that the apparatus of Inoue operates in the functional manner claimed by applicant." Applicants respectfully disagree and submit that US patent law does not preclude patentability of a process claim simply because it produces a same result as another distinct process.

Following the Examiner's thought process one would come to the conclusion that once a problem had been solved by applying a specific method based upon one set of mathematical principles, no alternative solutions to the same problem applying methods based on different mathematical principles will ever be patentable. Applicants respectfully submit that the Examiner's analysis is inconsistent with commonly accepted US patent practice.

As presented below the signals analyzed in the claimed method and apparatus are clearly distinguished from the detector disclosed in Inoue. Therefore, a person of ordinary skill in the art would have no apparent reason to create the Applicants' allegedly obvious claim elements.

More specifically, Inoue appears to disclose a detector for detecting foreign matter in object by using discriminant electromagnetic parameters. This detector comprises a transducer 10 (see Fig. 1) delivering a detection signal XY that is input to multiplier/detectors 7A and 7B (see column 6, lines 17-67). This detection signal XY is amplified by the amplifier 6, and then input to the multiplier/detectors 7A and 7B. The detection signal, which is input to the multiplier/detector 7A, is detected by multiplication by a reference signal having a phase which is the same the phase of the signal produced by oscillator 1. Specifically, the output signal of the oscillator 1 is input to the multiplier/detector 7A as a reference signal and is referred to as in-phase detected signal Xde. The detection signal XY input to the multiplier/detector 7B is detected by multiplication by a reference signal having a phase which is shifted 90° from the phase of the signal produced by oscillator 1. Specifically, the output signal of the oscillator 1 is

shifted by  $90^\circ$  by a phase shifter 8 and is then input to the multiplier/detector 7B as a reference signal. The signal detected by detector 7B is referred to as phase shifted detected signal Yde.

The detected signals Xde and Yde are processed by corresponding smoothers/filters 9A and 9B so that they become filtered signals Xf and Yf. Filtered signal Xf corresponds to the signal component of the differential signal which is in-phase with the signal of oscillator 1, and filtered signal Yf corresponds to the signal component of the differential signal which has a  $90^\circ$  phase delay from the signal of the oscillator 1. The filtered signals Xf and Yf are converted to digital signals Xdi and Ydi by the corresponding A/D converters 12A and 12B, respectively. The digital signals Xdi and Ydi are then input to the corresponding weighting circuits 14A and 14B performing weighting computation characterized by a time distribution. The weighted output signals Xw and Yw are provided to the input interface 15A of a control device 15, which comprises a central processing unit 15B.

The central processing unit (CPU) 15B has a program for the recognition of the primary values of the Xw and Yw signals output from the weighting circuits 14A and 14B. The "primary value" is the representative value for the electromagnetic characteristics of an object being inspected (see column 8, lines 8-14). FIG. 13 shows vectors which represent the primary values Xp and Yp for various materials plotted in a Cartesian coordinates system. The central processing unit 15 includes a program for identification that works on the assumption that because there is correlation between representative values X and Y which are primary values Xp and Yp, the plotting of the pairs of these values on a coordinate system is generally distributed in an elliptical shape as shown in FIG. 14 (see col. 10, lines 49-58). FIG. 14 shows a two-axis four-quadrant plane on which the points  $P_1 (X_{p1}, Y_{p1})$ ,  $P_2 (X_{p2}, Y_{p2})$ , etc., represent the primary values Xp and Yp for various volumes of products of the same type which have material effect, but which contain no foreign matter. In the program for identification a discriminant equation for an elliptical region is established which includes correlation. By including correlation in the equation, the region can be more narrowly defined than if

correlation is not taken into consideration. The introduction of the concept of correlation improves the capacity to judge the presence of foreign matter.

From the above it becomes clear that the concepts, processes and analyzed signals are completely different from that of the present invention. Particularly, the prior art detector neither creates locus curves nor analyzes any locus curve. Inoue fails to give the least hint that could prompt a person of ordinary skill to make use of the concept of analyzing locus curves for detecting objects in a stream of materials.

Accordingly, Applicants respectfully submit that independent claims 1 and 13 are patentable over Inoue.

Claims 2-12 and 14-26 depend from these independent claims and are likewise patentable over the asserted combination of references for at least their dependence on an allowable base claim, as well as for the additional features they recite. Accordingly, withdrawal of this rejection is respectfully requested.

### **New Claims**

New claims 27-35 depend variously from claims 1 and 13 and are based upon feature of the original claims. Claims 27-35 are likewise patentable at least based upon their dependence on an allowable base claims as well as for the claimed subject matter.

### **Conclusion**

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited.

Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of

this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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A handwritten signature in cursive script, reading "Kenneth M. Berner".

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